

## *Program*

### *6th November Conference for Norwegian / Brazilian Energy Research: Petroleum Industry Transformations*

*Monday 12<sup>th</sup> - Tuesday 13<sup>th</sup> November 2018*

*Centro Brasileiro de Pesquisas Físicas (CBPF), Rio de Janeiro*

#### *Program Description*

The sixth annual November Conference for Norwegian / Brazilian Energy Research is planned to be held at Centro Brasileiro de Pesquisas Físicas (CBPF) in Rio de Janeiro on Monday 12<sup>th</sup> and Tuesday 13<sup>th</sup> November 2018. As in previous years we will be bringing together researchers and industrial practitioners from Norway and Brazil to present and discuss their ongoing and potential bilateral research, innovation and educational projects. The six thematic areas are chosen to reflect the BN21 agreement. This year the focus will be on how energy research shall respond to the driving forces for transformation – digital, environmental and social.

#### *Program Committee*

*Draft – will need co-chairs from Brazilian Institutions*

Program Chairman: David Cameron, UiO

Flow Assurance: Andrea Schmueli, SINTEF Petroleum; João Carneiro, ISdB FlowTech

Digitalization and Automation: Arild Nystad, NTNU

Subsea Technologies: Sigbjørn Sangesland, NTNU

Exploration and Geosciences: Ritske Huismans, UiB

Materials: Rolf Nyborg, IFE; Jose Antonio da Cunha Ponciano Gomes, COPPE/UFRJ

Environmental Impact of Improved Oil Recovery: Steinar Sanni, NORCE, Paolo Couto, UFRJ

#### *Program*

Monday 12th November

08:30 Welcome Coffee and Registration

09:00 Welcome by CBPF, Norwegian Consulate General, FINEP and Innovation Norway.

#### **Energy Transformations: Brazilian and Norwegian Perspectives:**

##### **Moderator Stein-Gunnar Bondevik, Manager, Innovation Norway**

Plenary session with invited presentations about the changing landscape for energy and petroleum in Brazil and Norway. What do we have in common? What are the differences in our situations? How can we work together to meet this changed landscape?

09:15 Setting the scene: perspectives from the Norwegian Department of Petroleum and Energy, William Christensen, Deputy Director General, Research and Technology, Norwegian Department of Petroleum and Energy

09:35 Keynote Address: Petroleum Industry Transformations, Taran Thune, Professor, TIK Centre for Technology, Innovation and Culture, University of Oslo

- 10:15 Coffee break
- 10:45 Response on Brazilian Perspectives on Transformation Antonio Bothelo, Sophia University (Tokyo) & Universidade Candido Mendes (Rio de Janeiro)
- 11:15 Energy research and innovations in Norway, Johan E. Hustad, Professor, Director NTNU Energy
- 11:40 A Brazilian Industrial Perspective, Aly Brandenburg, Shell Brazil
- 12:05 Quantum Technology Applied to Oil Research, Prof. Ivan Oliveira, CBPF.  
This talk discusses (at a non-technical level) two examples of applications of quantum technologies which promise to become available in a few years to the research of oil and gas: (i) quantum sensors and (ii) quantum computing. Quantum sensors based on NV-Centers can help to understand the so-called problem of molhability by locally probing the fluid-solid interaction in porous media. Gravity quantum sensors, on the other hand, are capable of probing the gravitational force with unprecedented sensitivity, and can be used to produce images of mass distributions in the subsoil. Finally, the recent discovery of a quantum inversion algorithm will allow, if run in a quantum computer, can reduce the processing time of field data from months to possibly a few seconds.
- 12:30 Lunch
- 14:30 Parallel Sessions:  
Exploration and Geosciences  
Materials Technology
- 17:10 Transport to dinner
- 18:00 Conference Dinner

## Tuesday 13<sup>th</sup> November

- 08:30 Breakfast and registration
- 09:00 Education and Funding  
Moderator, David Cameron, University of Oslo  
Short introductions from SiU, NFR, CAPES, FINEP  
Panel on experience of funding: achievements and challenges.
- 10:00 Parallel sessions  
Digitalization and Automation  
Subsea Field Development
- 12:40 Lunch
- 14:30 Parallel Sessions  
Environment and Improved Oil Recovery  
Flow Assurance
- 17:10 Closing remarks

## *Exploration and Geosciences (Monday 14:30-17:10)*

Exploration Geoscience, Linking deep and shallow processes, on and offshore

- 14:30 Jan Inge Faleide (Oslo University), Rifted passive margins: comparing the Norwegian and Brazilian margin.
- 14:50 Jose Soares (University Brasilia), Onshore deep seismic acquisition

- 15:10 Sergio Fontes (National Observatory), Brazil seismic network, tomographic studies onshore and offshore perspective
- 15:30 Stephane Rondenay (Bergen University), Deep seismic constraints on an offshore structure
- 15:50 Ricardo Trindade (University of Sao Paolo), Stream: Old analogues for modern Brazilian rifted passive margin
- 16:10 Rob Gawthorpe (Bergen University), Sedimentary basin evolution and sub surface analogues
- 16:30 Ritske Huismans (Bergen University), Processes underlying rifted passive margin formation.
- 16:50 Victor Sacek (University of Sao Paolo), Connection between deep and shallow geodynamic processes

*Materials (Monday 14:30–17:10)*

- 14:30 Welcome and opening remarks
- 14:40 Fabricio Pinheiro dos Santos, Petrobras: Corrosion Problems in Flexible Risers
- 15:00 Tatiane Oliveira Campos, UFRJ: Corrosion of armour wire steels in the annulus of flexible pipes at near neutral pH
- 15:20 Pedro Netto da Silva, UFRJ: Investigation of stress corrosion cracking of tensile armour wires in simulated annulus environment
- 15:40 Break
- 16:00 Arne Dugstad, IFE: Corrosion of carbon steel in dense phase and supercritical CO<sub>2</sub> - effect of small amounts of water
- 16:20 Gustavo Leitão Vaz and Pedro Altoe Ferreira, Petrobras: Internal corrosion prediction practices for life cycle integrity management
- (16:40 Presentation by SINTEF (tbc) )

*Subsea Field Development (Tuesday 10:00–12:40)*

- 10:00-10:05 Welcome and opening remarks
- 10:05-10:25 Subsea developments perspective NORWAY: Dr. Peter W. J. Derks, Senior Researcher Process Technology Upstream R&T FT RTCR Equinor Brasil Oleo e Gas.
- 10:25-10:45 Subsea developments perspective BRAZIL: Cassio Kuchpil – TES (Tecnologia de Equipamentos Submarinos) PETROBRAS
- 10:45-11:05 Optimizing subsea production facilities layout to minimize risk and cost, Tor Berge Gjersvik, NTNU
- 11:05-11:25 Marine operations for wellbore intervention and production: Prof. Celso K Morooka, Unicamp
- 11:25-11:35 Coffee Break
- 11:35-11:55 ConBuoy – New floating platform concept for reducing heave motion, Professor Bernt Leira, NTNU
- 11:55-12:15 Applying Advanced Process Control to the Subsea Environment, Professor Maurício B. de Souza Jr. Departamento de Engenharia Química, Escola de Química (UFRJ)
- 12:15-12:35 Subsea production and separation – An ongoing PhD research program at NTNU (SUBPRO), and BN INTPART – Brazilian-Norwegian Subsea Operations Consortium (BN-SOC) Professor Sigbjørn Sangesland, NTNU

12:35-12:40 Final remarks,

*Digitalization and Automation (Tuesday 10:00-12:40)*

Session Chair: Arild N. Nystad, NTNU

- 10:00 Opening Address – Digitalization/Automation opportunities in offshore Brazil and Norway, Arild N. Nystad, NTNU
- 10:10 Organizational and human aspects of digitalization in Oil and Gas, Prof. Eric Monteiro, NTNU
- 10:30 Status of Ontology-Based Data Access in Exploration, Adnan Latif, UiO
- 10:50 Coffee Break
- 11:10 Building ontologies for the petroleum domain, Prof. Mara Abel, UFRGS
- 11:30 Data-Driven Modeling for Control and Optimization of Oil Production Systems, Prof. Eduardo Camponogara, UFSC
- 11:50 Digitalization of production optimization efforts using AI, Bjarne Grimstad, CTO, Solution Seeker
- 12:10 – 12:40 Round table discussion - Digitalization/Automation opportunities in offshore Brazil and Norway.

*Environment and Improved Oil Recovery (Tuesday 14:30-17:10)*

Common aims for Norwegian and Brazilian offshore oil and gas industry are to achieve exploration and production with energy-efficient and environmentally safe way. This session will therefore combine the topics with emphasis on Environment and IOR – Improved Oil Recovery. The purpose is to achieve higher quality and output of the research and education for these combined IOR- and Environment aims. EOR, Enhanced Oil Recovery, or IOR with chemicals, is an important technology for both Norway and Brazil to maximize utilization of national resources. However, EOR will lead to increased use of EOR chemicals and additional top-side processes, therefore will require more and new research to minimize the environmental foot print and at the same time to improve energy efficiency. This session intends to gather professionals in both disciplines for discussions on future research efforts for offshore E&P in this context.

- 14:30 Welcome. Paolo Couto, Steinar Sanni
- 14:40 Most interesting types of IOR/EOR solutions for offshore Brazilian fields (TBC). Paolo Couto, UFRJ
- 14:55 The IOR Centre of Norway. Jan Ludvig Vinningland, NORCE
- 15:10 SMART Water for IOR. Torleiv Bilstad, Remya Nair, UiS
- 15:25 A Green-shift for Single Well Chemical Tracer Tests (SWCTT): From Barrels to Vials by New Sets of Novel Tracers. Rolf Nyborg, Christian Dye, Martin Foss, IFE
- 15:40 Break (25 mins.)
- 16:05 Environmental Risk Assessment for methodology for operational discharges on Norwegian Continental Shelf and applicability to IOR solutions. Emily Lyng, Steinar Sanni, NORCE
- 16:20 Image processing, artificial intelligence, classification and simulations of rocks properties in multiscale. Clecio Roque De Bom, CBPF
- 16:35 The production of chemicals from CO<sub>2</sub>. Aline Dumaresq et al. et al., SENAI CETIQT
- 16:50 Discussion, possible collaboration, sum up, Paolo, Steinar

17:10 End

*Flow Assurance (Tuesday 14:30-17:10)*

14:30 Welcome and opening remarks - Dr. João Carneiro (ISDB Flowtech) Dr. Andrea Shmueli (SINTEF)

14:35 Industrial Presentation (TBA)

14:55 Flow Assurance challenges//Real-Time Flow Assurance Monitoring (CONFIRMED INTEREST but checking internal permissions) – REPSOL/ROCSOLE

15:15 Machine Learning/Deep Learning applications coupled with Flow assurance simulations – Andreia Fiuza - Kongsberg Digital –

15:35 Modeling and Simulation of hydrate transport in multiphase pipeflow – Vinicius Girardi/Marcelo Pasqualette - ESSS/ISDB Flowtech

15:40 Break (25 mins.)

16:05 Challenges on high CO<sub>2</sub> content flows (pre-salt)– Roberto Fonseca – PETROBRAS

16:25 Non-linear mechanisms in gas-liquid flow - Anis Ayati – UiO

16:45 Wax deposition modeling and experimentation – Luis Fernando Azevedo - PUC-Rio

17:05 Joint R&D efforts within flow assurance between Brazil/Norway- Brownfields and greenfields application – Andrea Shmueli/João Carneiro – SINTEF/ ISDB Flowtech

17:10 End